



BHCTP Monthly Discharge Monitoring Report

901 S Division
Pinehurst, ID 83850
Office 208/682-9190
Fax 208/682-2737
www.ferguson-contracting.com

Month: February-17
Facility: Central Treatment Plant
Location: Bunker Hill Superfund Site
Contract Number: W912DW-13-C-0026-P00012

Total Flow For The Month From 006 Outfall: 52,830,700 gallons

Sludge pumping to CIA sludge pond: 1,326,000 gallons

Total Flow From Kellogg Tunnel: 53,675,440 gallons

Percent of Influent Successfully Treated: 100.0%

12 sample days * 6 parameters (Pb, Cd, Zn, Mn, TSS & pH) = 72 potential exceedances
72 - 0 exceedances = 72 72/72 = 100%

Results of Sampling Efforts:

All sampling has been performed in accordance with specifications and the Sampling and Analysis Plan. QC and QA samples have been taken as required. All sample analysis results may be found within this DMR.

Performance Evaluation (PE) sampling for the CTP continued, with four PE samples delivered to SVL for this reporting period. The PE samples were identified as CTPXX (random CTP sites). These samples consisted of preserved 500-ml trace metal samples to be analyzed for Cd, Pb and Zn. The PE acceptable quantitation range is listed on the 'QC' page of this DMR.

Trip blank and rinsate samples were also taken, with the results being reported on the 'PTM-004,RB,TB' page of this DMR.

Highlights of Plant Maintenance and/or Plant Optimization:

02-01-17 Performed monthly fire extinguisher inspection. All CTP fire extinguishers are fully charged and in good working condition at this time.

02-01-17 Performed monthly pump and motor inspection. All CTP pumps and motors are in good condition at this time with the exception of the Rapid Mix gear box. Gear box vibration is increasing.

02-07-17 Performed lined storage pond pumping to decrease the volume of water and increase the available storage capacity.

02-08-17 Operators discovered a broken sewer discharge pipeline located approximately three feet from the sewer collection tank. Repairs of the broken pipe will be discussed with the COR.

02-09-17 CTP lead operator and process engineer attended the monthly CTP process review meeting. Process pH of 8.3 was discussed. KT discharge pumping schedule was reviewed. Process quality, plant operations and operator work schedules were reviewed. OMER projects were reviewed. The performance evaluation sample results were reviewed by the lead operator and process engineer.

02-15-17 Operators completed the pump and motor six-month oil changes. The maintenance report detailing the six-month oil changes was submitted to the COR with the CTP daily report 02-15-17.

02-16-17 Operators repaired the process water supply pipe located in the Polishing Pond pump house. The pipe was found leaking at the point where the pipe exits through the concrete wall. Operators had to remove a small amount of concrete around the pipe fitting to repair the pipe coupler.

02-16-17 Back-flushed the Clarifier underflow pipeline. During this KT low-flow period, the underflow pipes were back-flushed using city supply water. All three pipes were found to be clear of any blockage at this time.

02-27-17 Operators replaced the lime injection valve indicator linkage components. The valve indicator linkage failed on Sunday, February 26th. This repair required two operators to safely replace the linkage components.

02-28-17 03:30 Operators responded to an auto-dialer alarm. A short-term power outage caused all CTP pumps and motors to shut down. Operators restarted and inspected all pumps and motors. 04:00 CTP was placed back into full service. This short-term power outage did not activate the emergency generator.

02-28-17 Operators performed the monthly full load emergency generator run test. The emergency generator operated all CTP components for one hour as programmed with no issues or errors to report.

02-28-17 Performed the monthly flow meter resets and total flow documentation.

During this reporting period:

- The Kellogg Tunnel discharge flow was the same as February 2016, 53.7 mg.
- The Kellogg Tunnel zinc concentration decreased by 3% from February 2016, from an average of 52 mg/L to 50 mg/L.
- The CTP operating pH set point was increased to 8.5 from 8.3 during extended KT low-flow periods.
- The flocculent dosage remained at approximately 2 ppm to reduce process turbidity.
- The CTP sludge recycle rate remained at 400 gpm.
- CTP operators received one off-shift auto-dialer call-out alarm caused by a short-term power outage.
- CTP operators performed four pumping events from the Lined Pond.
- CTP operators verified Aeration Basin pH probe and grab sample values twice per day.
- CTP operators observed no Kellogg Tunnel mine or mill operations.
- CTP operators performed daily inspections of the lime slurry holding tank, with no leaks or increased corrosion found this month.

Lessons Learned

No significant lessons to report for last month.

MONITORING PERIOD					
YEAR	MO	DAY	YEAR	MO	DAY
2017	2	1	2017	2	28

PARAMETER		Quantity or Loading			Quality or Concentration				FREQUENCY OF ANALYSIS	SAMPLE TYPE
		MONTHLY AVERAGE	DAILY MAXIMUM	UNITS	MINIMUM	MONTHLY AVERAGE	DAILY MAXIMUM	UNITS		
pH	Sample Measurement				6.82		7.22		Continuous	Meter
	Permit Required				6.0		10.0			
Flow Thru Treatment Plant	Sample Measurement	1.89	2.24	mgd						
	Permit Required		Daily							
Lead Total - Pb Effluent	Sample Measurement	0.06	0.07	lbs/day		0.004	0.004	mg/L	three samples/ week	Comp 24
	Permit Required	14.8	37.0			0.30	0.60	mg/L		
Zinc Total - Zn Effluent	Sample Measurement	3.31	6.58	lbs/day		0.20	0.36	mg/L	three samples/ week	Comp 24
	Permit Required	36.2	91.3			0.73	1.48	mg/L		
Cadmium - Cd Effluent	Sample Measurement	0.06	0.143	lbs/day		0.004	0.008	mg/L	three samples/ week	Comp 24
	Permit Required	2.40	6.10			0.050	0.100	mg/L		
Manganese - Mn Effluent	Sample Measurement	245	430	lbs/day		15.5	25.2	mg/L	three samples/ week	Comp 24
	No Permit Required					N/A	N/A	mg/L		
Total Suspended Solids - TSS	Sample Measurement	10.3	24	lbs/day		0.7	1.4	mg/L	three samples/ week	Comp 24
	Permit Required	985	1907			20	30	mg/L		

PREPARED BY: GARY FULTON

REVIEWED BY: Mark Reinsel, Ph.D., P.E.

NPDES DISCHARGE POINT 006
CENTRAL TREATMENT PLANT
MONTH: Feb-17

DAY	LEAD (Pb)		ZINC (Zn)		CADMIUM (Cd)		MANGANESE (Mn)		pH	FLOW	TSS		LOADING
	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day			mgd	mg/L	lbs/day
1	0.004	0.054	0.095	1.42	0.003	0.04	13.3	198	6.96	1.79	0.8	11.9	5.41
2		0.054		1.42		0.04		199		1.80		12.0	5.43
3	0.004	0.054	0.102	1.53	0.002	0.03	13.7	206	6.82	1.80	1.4	21.0	9.54
4		0.061		1.72		0.04		231		2.02		23.6	10.7
5		0.054		1.52		0.03		204		1.79		20.9	9.46
6	0.004	0.056	0.127	1.96	0.002	0.03	17.0	263	6.97	1.85	1.0	15.5	7.01
7		0.037		1.31		0.02		176		1.24		10.3	4.69
8	0.004	0.025	0.128	0.90	0.002	0.02	13.7	96	6.88	0.84	1.2	8.45	3.83
9		0.047		1.66		0.03		177		1.55		15.5	7.04
10	0.004	0.061	0.156	2.63	0.002	0.03	8.79	148	7.04	2.02	0.6	10.1	4.59
11		0.059		2.54		0.03		143		1.95		9.76	4.43
12		0.060		2.61		0.03		147		2.01		10.0	4.55
13	0.004	0.057	0.140	2.22	0.002	0.04	15.5	246	6.91	1.90	0.2	3.17	1.44
14		0.063		2.47		0.04		273		2.11		3.53	1.60
15	0.004	0.058	0.135	2.19	0.003	0.05	16.9	274	6.91	1.94	0.2	3.24	1.47
16		0.060		2.24		0.05		281		1.99		3.32	1.51
17	0.004	0.047	0.138	1.81	0.002	0.03	16.9	222	6.90	1.58	0.8	10.5	4.77
18		0.060		2.29		0.04		280		1.99		13.3	6.02
19		0.053		2.02		0.04		248		1.76		11.7	5.32
20	0.004	0.056	0.349	5.47	0.007	0.12	6.80	107	7.22	1.88	0.6	9.40	4.26
21		0.067		6.53		0.14		127		2.24		11.2	5.09
22	0.004	0.067	0.355	6.58	0.008	0.14	15.6	289	6.96	2.22	0.4	7.41	3.36
23		0.065		6.46		0.14		284		2.18		7.28	3.30
24	0.004	0.065	0.360	6.49	0.006	0.12	23.2	418	6.92	2.16	0.4	7.21	3.27
25		0.064		6.37		0.11		410		2.12		7.08	3.21
26		0.063		6.33		0.11		408		2.11		7.03	3.19
27	0.004	0.059	0.357	5.86	0.006	0.09	25.2	381	6.86	1.97	0.4	6.56	2.98
28		0.061		6.09		0.10		430		2.04		6.82	3.09
Total	0.043	1.587	2.442	92.634	0.046	1.734	186.6	6866.6	83.35	52.831	8.000	287.9	130.6
Sample Events	12	28	12	28	12	28	12	28	12	28	12	28	28
Daily Average	0.004	0.057	0.204	3.31	0.004	0.062	15.5	245	6.95	1.89	0.67	10.3	4.66
Lab Detection Limit	0.003	0.004	0.001		0.004		0.004		0.01		0.800		

MIN 0.004 0.025 0.095 0.902 0.002 0.017 6.800 96.492 6.820 0.844 0.200 3.171 1.438
MAX 0.004 0.067 0.360 6.577 0.008 0.143 25.200 429.841 7.220 2.241 1.400 23.600 10.703

Notes:

(X mg/L) * (1 kg/10^6 mg) * (2.205 lbs/kg) * (3.785 L/gal) * (10^6 gal/Mgal) * (Y Mgal/day) = (X) * (Y) * (8.345) in lbs/day
(X lbs/day) * (1 kg/2.205 lbs) = (X) / (2.205) in kg/day

KELLOGG TUNNEL DISCHARGE

CENTRAL TREATMENT PLANT

MONTH: Feb-17

Data from SVL

DAY	LEAD (Pb)		ZINC (Zn)		CADMIUM (Cd)		MANGANESE (Mn)		pH	006 FLOW		TSS	
	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day		mgd	mg/L	lbs/day	kg/day
1		5.76		655		1.07		1,053		1.79		1,149	521
2	0.386	5.78	44	658	0.072	1.07	71	1,058	3.32	1.80	77	1,153	523
3		5.80		659		1.08		1,060		1.80		1,157	525
4		6.51		740		1.21		1,190		2.02		1,298	589
5		5.75		654		1.07		1,052		1.79		1,147	520
6	0.369	5.71	53	816	0.085	1.31	68	1,053	3.23	1.85	75	1,160	526
7		3.82		546		0.88		705		1.24		776	352
8		2.60		372		0.60		480		0.84		528	240
9	0.398	5.15	47	601	0.073	0.95	73	939	3.25	1.55	79	1,022	463
10		6.71		784		1.24		1,224		2.02		1,332	604
11		6.48		757		1.19		1,181		1.95		1,286	583
12		6.66		778		1.23		1,215		2.01		1,322	599
13	0.526	8.34	42	661	0.070	1.10	67	1,062	3.28	1.90	62	983	446
14		9.28		736		1.23		1,182		2.11		1,094	496
15		8.52		675		1.13		1,085		1.94		1,004	455
16	0.480	7.97	45	744	0.077	1.29	65	1,074	3.26	1.99	73	1,212	550
17		6.31		589		1.02		851		1.58		960	435
18		7.96		743		1.28		1,073		1.99		1,210	549
19		7.04		657		1.14		949		1.76		1,071	486
20	0.628	9.84	50	785	0.086	1.35	60	940	3.11	1.88	74	1,160	526
21		11.74		937		1.61		1,122		2.24		1,384	628
22		11.63		928		1.59		1,112		2.22		1,371	622
23	0.605	11.01	55	1,004	0.096	1.74	62	1,133	3.13	2.18	75	1,364	619
24		10.91		995		1.73		1,123		2.16		1,352	613
25		10.70		977		1.70		1,102		2.12		1,327	602
26		10.64		970		1.69		1,095		2.11		1,319	598
27	0.550	9.02	66	1,075	0.114	1.87	67	1,103	3.04	1.97	89	1,460	662
28		9.38		1,117		1.94		1,146		2.04		1,518	688
Total	3.94	217.01	400.50	21614.18	0.67	36.28	532.50	29362.34	25.62	52.83	604.00	33117.61	15019.33
Sample Events	8	28	8	28	8	28	8	28	8	28	8	28	28
Daily Average	0.493	7.8	50.1	772	0.084	1.30	66.6	1,049	3.20	1.89	76	1183	536

Notes:

$$(X \text{ mg/L}) * (1 \text{ kg}/10^6 \text{ mg}) * (2.205 \text{ lbs/kg}) * (3.785 \text{ L/gal}) * (10^6 \text{ gal/Mgal}) * (Y \text{ Mgal/day}) = (X) * (Y) * (8.345) \text{ lbs/day}$$

$$(X \text{ lbs/day}) * (1 \text{ kg}/2.205 \text{ lbs}) = (X) / (2.205) \text{ kg/day}$$

**PTM Effluent at Lined Storage Pond
CENTRAL TREATMENT PLANT**

Month: Feb-17

DATE	LEAD mg/L	ZINC mg/L	CADMUM mg/L	pH s.u.	TSS mg/L
02/02/17	0.015	8.5	0.96	7.49	0.6
02/16/17	0.030	10.3	1.03	7.31	0.6

**RINSATE AND TRIP BLANKS
CENTRAL TREATMENT PLANT**

Month: Feb-17

Rinsate and Trip Blank samples will be taken approximately every 20 QC events, or one each per month.

LOCATION	DATE	SAMPLE	LEAD mg/L	ZINC mg/L	CADMUM mg/L
Rinsate & Trip Blank					
Kellogg Tunnel Discharge	RB-02-23-17	<0.01	<0.004	<0.002	
Trip Blank (D.I.water)	TB-02-23-17	<0.01	<0.004	<0.002	

Bunker Hill Central Treatment Plant																																			
Daily log February 2017																																			
			AERATION BASIN				CLARIFIER				DISCHARGE 006				RECYCLE SG			LIME SLURRY			SLUDGE PUMP		POND PUMP		SLUDGE GUN TEST	LINED POND									
			INFLUENT KT		a.m.		p.m.		a.m.		p.m.		TURB		TEMP		pH3		grab		TURB		FLOW	SG	GPM	SG	%solid	Closed/Open	pump #	min	ON	OFF	10' Out	20' Out	Elevation (mg)
DATE	Operators		GPM	pH	SET	pH1	grab	pH1	grab	pH2	grab	pH2	grab	TURB	TEMP	pH3	grab	pH3	grab	TURB	Flow	SG	GPM	SG	%solid	Closed/Open	pump #	min	ON	OFF	10' Out	20' Out	ESTIMATED		
2/1	GF,GC,SB					8.3	8.4	8.4	8.3	8.3	8.3	8.1	8.0	8.1	7.9	1.03	44	7.3	7.1	7.4	7.1	0.99	1.79	1.041	400	1.073	11.3	273/15	3	90			10"	6"	2270.0 (1.5mg)
2/2	GF,GC,SB	1350	3.02	8.3	8.3	8.3	8.3	8.3	8.3	8.0	7.8	8.1	7.9	1.20	44	7.3	7.2	7.4	7.1	1.00	1.80	1.038	400	1.073	11.3	289/15	3	60						2270.0	
2/3	GC,GF					8.3	8.3	8.3	8.3	8.3	8.0	8.1	8.0	1.16	40	7.3	7.1	7.4	7.1	1.10	1.80	1.042	400	1.072	11.1	292/15	3	90						2270.0	
2/4	GC					8.3	8.3	8.4	8.3	8.3	7.9	7.9	7.9	1.38	43	7.4	7.1	7.4	7.1	1.24	2.02	1.038	400	1.072	11.1	266/15	3	90						2270.0	
2/5	SB					8.3	8.3	8.4	8.3	8.3	8.0	7.9	7.9	1.23	45	7.4	7.1	7.4	7.1	0.99	1.79	1.037	400	1.071	11.0	262/15	3	65						2270.0	
2/6	GF,SB	1431	3.10	8.3	8.3	8.3	8.3	8.3	8.3	7.9	7.8	7.9	7.9	1.15	47	7.3	7.1	7.3	7.2	1.00	1.85	1.039	400	1.070	10.8	260/15	3	80						2270.0	
2/7	GF,SB,GC					8.5	8.5	8.4	8.6	8.5	7.9	7.8	8.0	7.9	1.20	41	7.4	7.0	7.2	7.2	1.25	1.24	1.030	400	1.070	10.8	315/10	3	0					2270.0	
2/8	GF,SB,GC					8.5	8.5	8.4	8.3	8.3	8.1	7.9	8.0	0.90	41	7.3	7.1	7.2	7.2	0.84	0.84	1.032	400	1.069	10.7	330/10	3	65						2270.0	
2/9	GF,SB,GC	1350	2.85	8.3	8.3	8.3	8.3	8.3	8.3	8.1	8.0	8.1	7.9	0.84	47	7.4	6.9	7.4	7.0	0.84	1.55	1.046	400	1.068	10.5	263/15	3	90						2270.0	
2/10	GF,GC					8.3	8.3	8.3	8.3	8.2	8.0	7.8	8.0	0.80	44	7.4	7.1	7.5	7.2	0.72	2.02	1.039	400	1.068	10.5	266/15	3	90						2271.0 (2.25mg)	
2/11	GC					8.3	8.3	8.3	8.3	8.3	8.0	7.8	8.1	0.74	42	7.4	7.2	7.4	7.1	0.69	1.95	1.038	400	1.068	10.5	256/15	3	90						2271.0	
2/12	SB					8.3	8.3	8.3	8.3	8.3	8.4	8.1	7.8	8.1	0.82	41	7.4	7.1	7.4	7.1	0.74	2.01	1.040	400	1.068	10.5	267/15	3	90						2271.0
2/13	GF,SB	1410	2.91	8.3	8.3	8.3	8.3	8.3	8.3	8.1	7.8	8.1	7.8	1.00	42	7.3	7.1	7.4	7.2	0.80	1.90	1.038	400	1.067	10.4	256/15	3	90						2271.0	
2/14	GF,SB					8.3	8.3	8.2	8.3	8.3	8.0	7.8	8.0	1.10	43	7.4	7.1	7.2	7.1	1.03	2.11	1.039	400	1.067	10.4	254/15	3	90						2271.0	
2/15	GF,SB					8.3	8.3	8.3	8.3	8.2	7.9	7.8	8.0	1.10	44	7.4	7.0	7.4	7.1	0.78	1.94	1.038	400	1.068	10.5	247/15	3	75						2271.5 (2.5mg)	
2/16	GF	1431	2.90	8.3	8.3	8.3	8.5	8.6	8.0	7.9	7.9	1.17	52	7.4	7.2	7.1	7.2	0.75	1.99	1.041	400	1.066	10.2	242/15	3	90	#3 12:30	14:00					2271.5		
2/17	GF					8.5	8.5	8.5	8.4	8.5	7.8	7.8	8.0	1.10	47	7.3	7.2	7.3	7.3	0.80	1.58	1.032	400	1.067	10.3	270/10	3	80	#3 05:15	14:00					2271.5
2/18	GF					8.5	8.4	8.5	8.6	8.6	7.8	7.9	8.1	0.80	46	7.3	7.2	7.3	7.2	0.95	1.99	1.030	400	1.067	10.4	228/10	3	75	#3 06:00	13:00					2271.0 (2.25mg)
2/19	SB					8.5	8.5	8.6	8.5	8.5	7.9	8.1	7.9	0.82	39	7.4	7.3	7.4	7.2	0.71	1.76	1.029	400	1.066	10.2	240/10	3	30						2270.5 (1.75mg)	
2/20	SB	1583	3.14	8.3	8.3	8.4	8.3	8.3	8.3	7.7	7.7	8.0	0.78	47	7.4	7.3	7.4	7.2	0.55	2.24	1.039	400	1.065	10.1	221/16	3	100						2270.5		
2/21	SB,GC					8.3	8.3	8.3	8.3	8.3	7.7	7.7	8.0	0.78	47	7.4	7.3	7.4	7.2	0.54	2.22	1.037	400	1.066	10.2	212/16	3	90						2271.0 (2.25mg)	
2/22	SB,GC					8.3	8.3	8.3	8.3	8.3	7.7	7.7	7.6	0.61	42	7.4	7.3	7.4	7.3	0.54	2.22	1.037	400	1.065	10.1	207/16	3	90						2271.0	
2/23	SB,GC	1580	3.10	8.3	8.3	8.3	8.3	8.3	8.3	7.7	7.7	7.6	0																						

CENTRAL TREATMENT PLANT**MISCELLANEOUS FLOWS**Month : **Feb-17**

Date	KT Flow Meter Reading
1/31/2017	0
2/28/2017	53,675,440
Total	53,675,440

Date	006 Flow Meter Reading
1/31/2017	0
2/28/2017	52,830,700
Total	52,830,700

Sweeny Pump Station Reading				
Date	#1 Pump	620 gpm	#2 Pump	500 gpm
1/31/2017	170.0	Hours	785.0	Hours
2/28/2017	170.0	Hours	785.0	Hours
Total Hours	0.0	Hours	0.0	Hours
Total Flow for 004/Sweeny For The Month =	0		0	Gallons

PTM Discharge Flow	
Date	Flow (gpm)
02/02/17	15.0
02/16/17	12.0
02/19/17	20.0

Date	Lined Storage Pond Water Level			
1/31/2017	1,500,000	gal	Elev. =	2270.0
2/28/2017	2,250,000	gal	Elev. =	2271.0

KELLOGG TUNNEL ANNUAL DISCHARGE FLOWS 2000-2009										
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Jan.	61,000,000	61,677,510	54,606,100	53,066,890	52,223,080	53,150,000	56,050,900	56,281,000	53,465,820	50,936,960
Feb.	57,600,000	45,584,000	52,840,000	46,493,470	48,306,920	49,860,000	51,188,000	50,511,300	49,282,209	48,146,111
March	60,730,000	57,740,360	50,452,060	60,162,290	59,852,720	58,073,000	56,332,830	65,443,650	54,578,130	61,712,540
April	68,680,000	54,846,000	65,583,230	63,335,350	50,715,310	53,775,350	72,039,280	66,636,500	61,690,530	63,055,350
May	97,719,900	57,501,901	76,082,410	63,335,350	53,245,000	54,181,650	72,027,000	63,203,308	86,680,760	70,233,580
June	69,800,000	55,835,590	67,299,960	59,532,434	50,451,170	51,750,000	68,385,600	57,981,410	82,622,590	64,623,180
July	63,698,850	53,652,330	64,820,120	66,252,746	56,538,980	55,255,000	64,054,000	58,282,900	66,324,500	61,535,000
Aug.	66,707,120	45,289,000	58,212,940	62,074,750	52,002,140	49,970,000	64,621,000	55,335,900	65,168,620	56,446,670
Sept.	55,797,530	50,276,020	60,140,460	43,789,000	49,208,020	49,987,000	54,515,270	50,471,870	61,074,020	57,006,430
Oct.	60,424,720	50,660,840	54,485,871	52,869,290	59,601,690	52,807,000	57,610,030	50,086,330	58,666,300	55,830,000
Nov.	53,408,660	50,660,840	51,072,259	47,600,000	51,948,000	50,722,600	55,191,700	50,779,040	52,041,780	54,956,800
Dec.	56,414,870	53,464,780	56,034,000	56,413,080	56,770,000	54,904,400	60,486,900	53,716,210	55,727,260	54,542,700
Totals	771,981,650	637,189,171	711,629,410	674,924,650	640,863,030	634,436,000	732,502,510	678,729,418	747,322,519	699,025,321

KELLOGG TUNNEL ANNUAL DISCHARGE FLOWS 2010-2019										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Jan.	55,503,180	61,797,170	58,434,610	61,855,400	57,478,450	58,440,540	52,196,730	49,352,650		
Feb.	50,819,910	54,556,227	57,763,170	59,383,290	54,607,950	59,767,470	53,694,400	53,675,440		
March	54,691,420	61,373,630	67,236,650	66,264,780	65,396,350	64,468,230	63,967,920			
April	56,255,340	65,687,340	81,233,630	69,619,100	65,618,770	63,056,840	63,323,620			
May	58,825,640	84,365,390	86,826,340	71,496,380	80,598,590	61,898,200	58,147,240			
June	56,770,200	79,985,540	83,440,990	64,663,900	65,623,330	56,368,540	53,149,810			
July	56,727,510	79,346,330	74,315,690	62,844,790	63,425,030	55,655,000	56,521,710			
Aug.	56,239,370	70,377,570	68,986,900	58,459,380	61,486,270	55,316,100	53,293,430			
Sept.	54,109,980	60,404,280	62,270,300	58,097,500	56,279,590	53,890,000	49,796,420			
Oct.	55,480,200	62,403,480	59,991,850	58,325,780	60,659,850	52,082,800	52,417,120			
Nov.	54,856,880	58,430,700	57,184,220	56,215,000	55,065,100	49,812,540	53,815,710			
Dec.	54,607,330	58,617,700	61,750,390	56,932,530	59,770,540	51,521,900	52,063,110			
Totals	664,886,960	797,345,357	819,434,740	744,157,830	746,009,820	682,278,160	662,387,220	103,028,090	0	0

Yellow indicates record monthly flow as well as record annual flow

KELLOGG TUNNEL ZINC DATA

Month	Concentration (mg/L)													
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Jan.		86	81	79	63	70	61	72	57	68	41	46	50	53
Feb.		86	91	96	55	72	57	95	58	68	41	68	52	50
March		94	116	86	65	68	53	86	58	69	58	81	63	
April		98	121	140	85	80	50	137	176	86	107	92	115	
May		105	231	179	318	136	57	377	215	150	177	87	138	
June		107	182	118	271	143	68	347	164	106	131	78	108	
July		90	144	111	198	117	75	181	136	87	87	75	81	
Aug.		87	112	92	132	94	79	130	110	86	76	66	76	
Sept.		84	107	80	107	76	81	132	107	75	66	63	68	
Oct.	59	81	100	88	99	75	70	86	70	67	63	54	52	
Nov.	66	79	88	88	104	63	57	95	71	70	55	44	52	
Dec.	67	62	78	65	76	59	61	88	69	54	49	55	50	
average	64	88	121	102	131	88	64	152	108	82	79	67	75	
lime usage (tons/day)	2.59	3.23	2.76	4.78	3.24	2.16	4.31	3.93	2.46	2.70	1.99	1.93		
Zinc Conc. Increase/Decrease	37%	-16%	29%	-33%	-27%	138%	-29%	-24%	-4%	-15%	12%			
Lime Usage Increase/Decrease	25%	-15%	73%	-32%	-33%	100%	-9%	-37%	10%	-26%	-3%			

		Bunker Hill Superfund Site				
		Kellogg, Idaho				
		Central Treatment Plant Review				
		Month: Feb-17				
SAMPLE	DATE	PARAMETER	VALUE	QC/dup	UNITS	PRECISION
LOCATION			RESULTS			% RPD
006/CTP Outfall	02/01/17	Cadmium	0.003	0.003	mg/L	3.6%
		Lead	0.004	0.004	mg/L	0.0%
Lab Duplicate		Manganese	13.3	13.5	mg/L	-1.5%
		Zinc	0.095	0.096	mg/L	-1.0%
		pH	6.96	6.95	s.u.	0.1%
		TSS	0.4	0.4	mg/L	0.0%
PTM Discharge	02/02/17	Cadmium	0.960	0.963	mg/L	-0.3%
		Lead	0.015	0.016	mg/L	-5.9%
QC Sample		Manganese			mg/L	
		Zinc	8.50	8.55	mg/L	-0.6%
		pH	7.49	7.45	s.u.	0.5%
		TSS	0.6	0.6	mg/L	0.0%
Performance Evaluation Sample	02/02/17	Cadmium	0.055	0.050	mg/L	9.9%
(CTPXX-02-02-17)		Lead	0.301	0.300	mg/L	0.3%
		Zinc	0.697	0.730	mg/L	-4.6%
CTPXX-02-02-17	02/02/17	Cadmium	0.055	0.055	mg/L	0.0%
		Lead	0.301	0.300	mg/L	0.3%
Lab Duplicate		Manganese	0.002	0.002	mg/L	0.0%
		Zinc	0.697	0.703	mg/L	-0.9%
006/CTP Outfall	02/03/17	Cadmium	0.002	0.002	mg/L	4.7%
		Lead	0.004	0.004	mg/L	0.0%
Lab Duplicate		Manganese	13.7	13.7	mg/L	0.0%
		Zinc	0.102	0.103	mg/L	-1.0%
		pH	6.82	6.77	s.u.	0.7%
		TSS	1.4	0.8	mg/L	54.5%
Kellogg Tunnel	02/06/17	Cadmium	0.085	0.086	mg/L	-1.5%
		Lead	0.396	0.400	mg/L	-1.0%
Lab Duplicate		Manganese	68.1	70.2	mg/L	-3.0%
		Zinc	52.8	54.8	mg/L	-3.7%
		pH			s.u.	
		TSS			mg/L	
006/CTP Outfall	02/06/17	Cadmium	0.002	0.002	mg/L	4.7%
		Lead	0.004	0.004	mg/L	0.0%
Lab Duplicate		Manganese	17.0	16.8	mg/L	1.2%
		Zinc	0.127	0.125	mg/L	1.6%
		pH	6.97	6.94	s.u.	0.4%
		TSS	1.0	1.0	mg/L	0.0%
006/CTP Outfall	02/08/17	Cadmium	0.002	0.002	mg/L	0.0%
		Lead	0.004	0.004	mg/L	0.0%
Lab Duplicate		Manganese	13.7	13.7	mg/L	0.0%
		Zinc	0.128	0.128	mg/L	0.0%
		pH	6.88	6.86	s.u.	0.3%
		TSS	1.2	1.2	mg/L	0.0%
Performance	02/09/17	Cadmium	0.057	0.050	mg/L	12.4%

SAMPLE	DATE	PARAMETER	VALUE	QC/dup	UNITS	PRECISION	MATRIX SPIKE DATA
LOCATION			RESULTS			% RPD	% RECOVERY
Evaluation		Lead	0.303	0.300	mg/L	1.0%	
Sample		Zinc	0.715	0.730	mg/L	-2.1%	
(CTPXX-02-09-17)					mg/L		
CTPXX-02-09-17	02/09/17	Cadmium	0.057	0.057	mg/L	-1.4%	99%
		Lead	0.303	0.310	mg/L	-2.3%	98%
Lab Duplicate		Manganese	0.002	0.002	mg/L	0.0%	103%
		Zinc	0.715	0.732	mg/L	-2.3%	96%
006/CTP Outfall	02/10/17	Cadmium	0.002	0.002	mg/L	-10.0%	
		Lead	0.004	0.004	mg/L	0.0%	
QC Sample		Manganese	8.79	8.50	mg/L	3.4%	
		Zinc	0.156	0.157	mg/L	-0.6%	
		pH	7.04	7.03	s.u.	0.1%	
		TSS	0.6	0.6	mg/L	0.0%	
006/CTP Outfall	02/10/17	Cadmium	0.002	0.002	mg/L	11.1%	102%
		Lead	0.004	0.004	mg/L	0.0%	96%
Lab Duplicate		Manganese	8.79	8.49	mg/L	3.5%	
		Zinc	0.156	0.155	mg/L	0.6%	97%
		pH	7.04	6.99	s.u.	0.7%	
		TSS	0.6	0.6	mg/L	0.0%	
006/CTP Outfall	02/13/17	Cadmium	0.002	0.002	mg/L	0.0%	99%
		Lead	0.004	0.004	mg/L	0.0%	95%
Lab Duplicate		Manganese	15.5	15.3	mg/L	1.3%	
		Zinc	0.140	0.140	mg/L	0.0%	96%
		pH	6.91	7.04	s.u.	-1.9%	
		TSS	0.2	0.4	mg/L	-66.7%	
Kellogg Tunnel	02/13/17	Cadmium	0.070	0.069	mg/L	0.1%	101%
		Lead	0.526	0.527	mg/L	-0.2%	96%
Lab Duplicate		Manganese	67.0	66.9	mg/L	0.1%	
		Zinc	14.7	14.9	mg/L	-1.4%	
		pH			s.u.		
		TSS			mg/L		
006/CTP Outfall	02/15/17	Cadmium	0.003	0.003	mg/L	10.9%	101%
		Lead	0.004	0.004	mg/L	0.0%	92%
Lab Duplicate		Manganese	16.9	16.9	mg/L	0.0%	
		Zinc	0.135	0.135	mg/L	0.0%	94%
		pH	6.91	6.76	s.u.	2.2%	
		TSS	0.2	0.0	mg/L	200.0%	
Performance	02/16/17	Cadmium	0.056	0.056	mg/L	0.2%	94%
Evaluation		Lead	0.306	0.305	mg/L	0.3%	93%
Sample		Manganese	0.002	0.002	mg/L	0.0%	96%
(CTPXX-02-16-17)		Zinc	0.715	0.714	mg/L	0.1%	91%
CTPXX-02-09-17	02/16/17	Cadmium	0.056	0.050	mg/L	11.7%	
		Lead	0.306	0.300	mg/L	2.0%	
Lab Duplicate		Zinc	0.715	0.730	mg/L	-2.1%	
					mg/L		
006/CTP Outfall	02/17/17	Cadmium	0.002	0.003	mg/L	-8.0%	100%
		Lead	0.004	0.004	mg/L	0.0%	95%
Lab Duplicate		Manganese	16.9	17.1	mg/L	-1.2%	113%
		Zinc	0.138	0.136	mg/L	1.5%	95%
		pH	6.90	6.83	s.u.	1.0%	

SAMPLE	DATE	PARAMETER	VALUE	QC/dup	UNITS	PRECISION	MATRIX SPIKE DATA
LOCATION			RESULTS			% RPD	% RECOVERY
		TSS	0.8	0.8	mg/L	0.0%	
006/CTP Outfall	02/20/17	Cadmium	0.007	0.008	mg/L	-4.0%	95%
		Lead	0.004	0.004	mg/L	0.0%	90%
Lab Duplicate		Manganese	6.78	7.09	mg/L	-4.5%	98%
		Zinc	0.349	0.356	mg/L	-2.0%	91%
		pH	7.22	7.20	s.u.	0.3%	
		TSS	0.6	0.6	mg/L	0.0%	
Kellogg Tunnel	02/20/17	Cadmium	0.086	0.085	mg/L	1.2%	101%
		Lead	0.628	0.619	mg/L	1.4%	96%
Lab Duplicate		Manganese	60.0	58.9	mg/L	1.9%	
		Zinc	50.1	48.4	mg/L	3.5%	
		pH			s.u.		
		TSS			mg/L		
006/CTP Outfall	02/22/17	Cadmium	0.008	0.007	mg/L	6.7%	100%
		Lead	0.004	0.004	mg/L	0.0%	95%
Lab Duplicate		Manganese	15.6	15.5	mg/L	0.6%	106%
		Zinc	0.355	0.350	mg/L	1.4%	95%
		pH	6.96	6.82	s.u.	2.0%	
		TSS	0.4	0.4	mg/L	0.0%	
Performance Evaluation Sample (CTPXX-02-23-17)	02/23/17	Cadmium	0.056	0.050	mg/L	12.0%	
		Lead	0.310	0.300	mg/L	3.3%	
		Zinc	0.725	0.730	mg/L	-0.7%	
					mg/L		
CTPXX-02-23-17	02/23/17	Cadmium	0.056	0.056	mg/L	1.4%	96%
		Lead	0.310	0.305	mg/L	1.6%	94%
Lab Duplicate		Manganese	0.002	0.002	mg/L	0.0%	95%
		Zinc	0.725	0.707	mg/L	2.5%	93%
Kellogg Tunnel	02/23/17	Cadmium	0.096	0.099	mg/L	-2.7%	
		Lead	0.605	0.624	mg/L	-3.1%	
QC Sample		Manganese	62.3	63.7	mg/L	-2.2%	
		Zinc	55.2	56.7	mg/L	-2.7%	
		pH	3.13	3.13	s.u.	0.0%	
		TSS	75.0	74.0	mg/L	1.3%	
006/CTP Outfall	02/24/17	Cadmium	0.006	0.006	mg/L	3.2%	100%
		Lead	0.004	0.004	mg/L	0.0%	95%
Lab Duplicate		Manganese	23.2	23.4	mg/L	-0.9%	
		Zinc	0.360	0.359	mg/L	0.3%	94%
		pH	6.92	6.89	s.u.	0.4%	
		TSS	0.4	0.4	mg/L	0.0%	
006/CTP Outfall	02/27/17	Cadmium	0.006	0.006	mg/L	1.8%	101%
		Lead	0.004	0.004	mg/L	0.0%	96%
Lab Duplicate		Manganese	25.2	24.8	mg/L	1.6%	
		Zinc	0.357	0.353	mg/L	1.1%	96%
		pH	3.04	3.04	s.u.	0.0%	
		TSS	0.4	0.4	mg/L	0.0%	
February 2017, Completeness		Cadmium	25	Valid	Total	25	
		Lead	25	Valid	Total	25	
		Manganese	20	Valid	Total	20	
		Zinc	25	Valid	Total	25	
		pH	15	Valid	Total	15	

SAMPLE	DATE	PARAMETER	VALUE	QC/dup	UNITS	PRECISION	MATRIX SPIKE DATA				
LOCATION			RESULTS			% RPD	% RECOVERY				
		TSS	15	Valid	Total	15					
Monthly Performance Evaluation											
Acceptable Quantitation Range											
Analyte		Concentration		Acceptable Quantitation Range							
			(mg/L)		(mg/L)						
Cadmium			0.050	0.040-0.060							
Lead			0.300	0.240-0.360							
Zinc			0.730	0.584-0.876							
Note: The PE quantitation range (listed above) from our PE sample source is less than required in the contract. The contract limits (listed below) have been utilized for this evaluation.											
Note: Performance evaluation samples have been given the designation "CTPXX" for purposes of blind submission to the analytical laboratory.											
Analytical Requirements											
	Quantitation		Accuracy		Completeness						
Cadmium	≤ 0.025 mg/L		80-120%		90%						
Lead	≤ 0.15 mg/L		80-120%		90%						
Manganese	≤ 0.025 mg/L		80-120%		90%						
Zinc	≤ 0.30 mg/L		80-120%		90%						
pH	≤ 0.1 pH unit		90-110%		90%						
TSS	≤ 15 mg/L		75-125%		90%						

Bunker Hill Superfund Site							
Kellogg, Idaho							
Central Treatment Plant Review							
Month: Feb-17							
CONCENTRATION (mg/L)							
SAMPLE	DATE	PARAMETER	SPIKE	DUPLICATE	SPIKE	PRECISION	
LOCATION			ADDED	RESULT	RESULT	% RPD	
006/CTP Outfall	02/01/17	Cadmium	1.00	0.993	0.985	0.9%	
MS/MSD		Lead	1.00	0.935	0.925	1.1%	
		Manganese	1.00	14.4	14.5	0.3%	
		Zinc	1.00	0.999	0.980	1.9%	
PE Sample	02/02/17	Cadmium	1.00	1.00	0.993	1.1%	
MS/MSD		Lead	1.00	1.24	1.23	1.3%	
CTPXX-02-02-17		Manganese	1.00	0.958	0.942	1.7%	
		Zinc	1.00	1.62	1.60	1.3%	
006/CTP Outfall	02/03/17	Cadmium	1.00	0.993	0.988	0.5%	
MS/MSD		Lead	1.00	0.928	0.930	0.2%	
		Manganese	1.00	14.8	14.5	1.8%	
		Zinc	1.00	1.04	1.04	0.3%	
Kellogg Tunnel	02/06/17	Cadmium	1.00	1.09	1.12	2.7%	
MS/MSD		Lead	1.00	1.34	1.37	2.6%	
		Manganese	1.00	67.5	68.2	1.0%	
		Zinc	1.00	52.4	53.9	2.9%	
006/CTP Outfall	02/06/17	Cadmium	1.00	1.00	0.995	0.8%	
MS/MSD		Lead	1.00	0.940	0.932	0.8%	
		Manganese	1.00	17.6	17.5	1.0%	
		Zinc	1.00	1.07	1.07	0.5%	
006/CTP Outfall	02/08/17	Cadmium	1.00	0.983	0.981	0.2%	
MS/MSD		Lead	1.00	0.928	0.923	0.5%	
		Manganese	1.00	14.3	14.5	1.3%	
		Zinc	1.00	1.05	1.04	1.0%	
PE Sample	02/09/17	Cadmium	1.00	1.05	1.05	0.0%	
MS/MSD		Lead	1.00	1.28	1.28	0.2%	
CTPXX-02-09-17		Manganese	1.00	1.02	1.03	1.1%	
		Zinc	1.00	1.68	1.67	0.4%	
006/CTP Outfall	02/10/17	Cadmium	1.00	0.996	1.02	2.4%	
MS/MSD		Lead	1.00	0.939	0.957	2.0%	
		Manganese	1.00	9.15	9.59	4.7%	
		Zinc	1.00	1.10	1.13	2.4%	
006/CTP Outfall	02/13/17	Cadmium	1.00	1.01	0.995	1.8%	
MS/MSD		Lead	1.00	0.960	0.945	1.6%	
		Manganese	1.00	16.3	16.1	1.6%	
		Zinc	1.00	1.11	1.10	0.8%	
Kellogg Tunnel	02/13/17	Cadmium	1.00	1.07	1.08	0.6%	
MS/MSD		Lead	1.00	1.47	1.48	1.1%	
		Manganese	1.00	67.2	67.5	0.5%	
		Zinc	1.00	41.9	42.1	0.4%	
006/CTP Outfall	02/15/17	Cadmium	1.00	1.00	1.01	1.1%	
MS/MSD		Lead	1.00	0.914	0.924	1.1%	
		Manganese	1.00	17.6	17.6	0.2%	
						Sample conc. >> spike level	

		Zinc	1.00	1.07	1.08	0.8%		
PE Sample	02/16/17	Cadmium	1.00	0.989	0.995	0.6%		
MS/MSD		Lead	1.00	1.22	1.23	0.7%		
CTPXX-02-16-17		Manganese	1.00	0.952	0.964	1.2%	Sample conc. >> spike level	
		Zinc	1.00	1.61	1.62	0.9%		
006/CTP Outfall	02/17/17	Cadmium	1.00	0.987	1.00	1.4%		
MS/MSD		Lead	1.00	0.933	0.946	1.4%		
		Manganese	1.00	17.9	18.0	1.0%	Sample conc. >> spike level	
		Zinc	1.00	1.07	1.09	1.5%		
Kellogg Tunnel	02/20/17	Cadmium	1.00	1.08	1.09	1.5%		
MS/MSD		Lead	1.00	1.57	1.59	1.2%		
		Manganese	1.00	60.8	62.1	2.2%	Sample conc. >> spike level	
		Zinc	1.00	49.7	50.0	0.6%		
006/CTP Outfall	02/20/17	Cadmium	1.00	0.968	0.952	1.6%		
MS/MSD		Lead	1.00	0.916	0.902	1.6%		
		Manganese	1.00	7.92	7.76	2.1%	Sample conc. >> spike level	
		Zinc	1.00	1.28	1.26	1.4%		
006/CTP Outfall	02/22/17	Cadmium	1.00	0.985	1.00	1.9%		
MS/MSD		Lead	1.00	0.934	0.952	1.9%		
		Manganese	1.00	16.2	16.6	2.6%	Sample conc. >> spike level	
		Zinc	1.00	1.27	1.31	2.7%		
PE Sample	02/23/17	Cadmium	1.00	0.997	1.01	1.4%		
MS/MSD		Lead	1.00	1.24	1.25	1.2%		
CTPXX-02-23-17		Manganese	1.00	0.943	0.951	0.9%	Sample conc. >> spike level	
		Zinc	1.00	1.62	1.65	2.0%		
006/CTP Outfall	02/24/17	Cadmium	1.00	0.991	1.00	1.0%		
MS/MSD		Lead	1.00	0.935	0.948	1.3%		
		Manganese	1.00	23.6	23.9	1.5%	Sample conc. >> spike level	
		Zinc	1.00	1.28	1.30	1.3%		
006/CTP Outfall	02/27/17	Cadmium	1.00	1.03	1.02	0.8%		
MS/MSD		Lead	1.00	0.970	0.957	1.4%		
		Manganese	1.00	26.0	25.4	2.4%	Sample conc. >> spike level	
		Zinc	1.00	1.32	1.31	0.8%		

USACE PRIME CONTRACTOR

Monthly Record of Work-Related Injuries/Illnesses & Exposure

US Army Corps of Engineers



North Division, February, 2017
Page 1 of 2

In accordance with the provisions of EM 385-1, Section C-1, Page 14 (Accident Reporting and Record-keeping), in the interest of safety and health protection of employees, it is required that all contractors and their employees report all injuries and illnesses to the U.S. Army Corps of Engineers, North Division, at the earliest opportunity. As required by OSHA, Section 1910.37(d)(1), this monthly report shall include all injuries (including non-work related) and illnesses (including non-work related) which occur to employees of the contractor or its subcontractors during the course of employment. This monthly report shall include all injuries and illnesses which occur to employees of the contractor or its subcontractors during the course of employment, except those which are caused by the willful or wanton acts of the employee. This monthly report shall include all injuries and illnesses which occur to employees of the contractor or its subcontractors during the course of employment, except those which are caused by the willful or wanton acts of the employee.

Contractor	Employee Last Name First Name Middle Initial	Date Employee Began Work	Date of Injury (or illness or death)	Description of Injury and Result	Location Where Work Was Performed	Length of Time From Injury to Report	Other Record Number (if applicable)	Number of Days Lost from Work Due to Injury or Illness	Number of Days Lost from Work Due to Injury or Illness (if applicable)	Number of Days Lost from Work Due to Injury or Illness (if applicable)	Number of Days Lost from Work Due to Injury or Illness (if applicable)
USACE				No accidents reported							

No accidents reported

Employee Name:	Signature of Person Submitting Report:	Total: : 0 0 0 0 0 0 0 0 0 0 0 0
Month: <u>February</u> , Year To Date: <u>NSD date</u>	Name of Person Submitting Report: <u>Johnathan Hallman</u>	Certification of Record <u>Johnathan Hallman</u> Signature: <u>Johnathan Hallman</u> Date: <u>2/27/17</u>

CTP Mine Water Line Open Channel Inspection Form

Note: This form should be utilized weekly during the regular channel cleanout.
Results will be include with the Daily Quality Control Report and monthly DMR.

Date: February 02, 2017

Inspected By:

Gary Coast, Steve Brunner

Item Inspected	Condition	Comments	
Channel Sections and Joints	Good / Poor	Check for cracks	Ok
Channel Inlet Connection @ KT	Good / Poor	Check for cracks	Ok
Channel Outlet/Pipeline Inlet	Good / Poor	Check for cracks	Ok
Channel Bottom (during low flows)	Good / Poor		Ok
Bottom Joints (during low flows)	Good / Poor		Ok
Trash Rack Assembly Rail Units	Good / Poor	Check for corrosion and bolt tightness	Ok
Trash Racks	Good / Poor	Removed debris from trash racks	
Parshall Flume	Good / Poor	Check fiberglass and joint connections	Ok

General Comments:

Bunker mine has one pump operating at this time.

The Kellogg Tunnel flow at this time is 1.94 mgd (1350 gpm), pH at this time is 3.01

The concrete flume walls are beginning to deteriorate approximately 6" up from the flume bottom.

The submerged area of the concrete is pitting and is now approximately 1/2" indented.

Alternate hand held staff gauge was used to verify flume staff gauge and flow meter readings.

Ultrasonic flow meter calibration was correct, no adjustments were needed.

CTP Mine Water Line Open Channel Inspection Form

Note: This form should be utilized weekly during the regular channel cleanout.
Results will be include with the Daily Quality Control Report and monthly DMR.

Date: February 09, 2017

Inspected By:

Gary Coast, Steve Brunner

Item Inspected	Condition	Comments	
Channel Sections and Joints	Good / Poor	Check for cracks	Ok
Channel Inlet Connection @ KT	Good / Poor	Check for cracks	Ok
Channel Outlet/Pipeline Inlet	Good / Poor	Check for cracks	Ok
Channel Bottom (during low flows)	Good / Poor		Ok
Bottom Joints (during low flows)	Good / Poor		Ok
Trash Rack Assembly Rail Units	Good / Poor	Check for corrosion and bolt tightness	Ok
Trash Racks	Good / Poor	Removed debris from trash racks	
Parshall Flume	Good / Poor	Check fiberglass and joint connections	Ok

General Comments:

The Kellogg Tunnel flow at this time is 1.94 mgd (1350 gpm), pH at this time is 2.85.

The concrete flume walls are beginning to deteriorate approximately 6" up from the flume bottom.

The submerged area of the concrete is pitting and is now approximately 1/2" indented.

Alternate hand held staff gauge was used to verify flume staff gauge and flow meter readings.

Ultrasonic flow meter calibration was correct, no adjustments were needed.

Operators collected no sediment from the flume area.

CTP Mine Water Line Open Channel Inspection Form

Note: This form should be utilized weekly during the regular channel cleanout.
Results will be include with the Daily Quality Control Report and monthly DMR.

Date: February 16, 2017

Inspected By:

Gary Fulton, Steve Brunner

Item Inspected	Condition	Comments	
Channel Sections and Joints	Good / Poor	Check for cracks	Ok
Channel Inlet Connection @ KT	Good / Poor	Check for cracks	Ok
Channel Outlet/Pipeline Inlet	Good / Poor	Check for cracks	Ok
Channel Bottom (during low flows)	Good / Poor		Ok
Bottom Joints (during low flows)	Good / Poor		Ok
Trash Rack Assembly Rail Units	Good / Poor	Check for corrosion and bolt tightness	Ok
Trash Racks	Good / Poor	Removed debris from trash racks	
Parshall Flume	Good / Poor	Check fiberglass and joint connections	Ok

General Comments:

The Kellogg Tunnel flow at this time is 2.06 mgd (1431 gpm), pH at this time is 2.90.

The concrete flume walls are beginning to deteriorate approximately 6" up from the flume bottom.

The submerged area of the concrete is pitting and is now approximately 1/2" indented.

Alternate hand held staff gauge was used to verify flume staff gauge and flow meter readings.

Ultrasonic flow meter calibration was correct, no adjustments were needed.

Operators collected approximately 1 gallon of sediment from the flume area.

Sediment collected from the flume area was disposed of at the CIA sludge pond.

CTP Mine Water Line Open Channel Inspection Form

Note: This form should be utilized weekly during the regular channel cleanout.
Results will be include with the Daily Quality Control Report and monthly DMR.

Date: February 23, 2017

Inspected By:

Gary Coast, Steve Brunner

Item Inspected	Condition	Comments	
Channel Sections and Joints	Good / Poor	Check for cracks	Ok
Channel Inlet Connection @ KT	Good / Poor	Check for cracks	Ok
Channel Outlet/Pipeline Inlet	Good / Poor	Check for cracks	Ok
Channel Bottom (during low flows)	Good / Poor		Ok
Bottom Joints (during low flows)	Good / Poor		Ok
Trash Rack Assembly Rail Units	Good / Poor	Check for corrosion and bolt tightness	Ok
Trash Racks	Good / Poor	Removed debris from trash racks	
Parshall Flume	Good / Poor	Check fiberglass and joint connections	Ok

General Comments:

The Kellogg Tunnel flow at this time is 2.27 mgd (1580 gpm), pH at this time is 3.10.

The concrete flume walls are beginning to deteriorate approximately 6" up from the flume bottom.

The submerged area of the concrete is pitting and is now approximately 1/2" indented.

Alternate hand held staff gauge was used to verify flume staff gauge and flow meter readings.

Ultrasonic flow meter calibration was correct, no adjustments were needed.

Operators collected no sediment from the flume area.



One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Ferguson Contracting 901 N. Division Pinehurst, ID 83850	Project: BHCTP	Sampled: 01-Feb-17
		Received: 01-Feb-17
		Reported: 02-Feb-17 13:05

LAB #	X780001-01	-	-	-	-	-
SAMPLE ID	006-02-01-17	-	-	-	-	-
	02/01/2017 06:00	-	-	-	-	-
Reporting Limit						
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.0028 [2]	-	-	-	-
Lead	0.0500 mg/L	<0.0036 [4]	-	-	-	-
Manganese	0.0200 mg/L	13.3 [3]	-	-	-	-
Zinc	0.020 mg/L	0.095	-	-	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	6.96 [1]	-	-	-	-
Total Susp. Solids	5.0 mg/L	0.4 [2]	-	-	-	-

John Kern
Laboratory Director



One Government Gulch - PO Box 929

Kellogg ID 83837-0529

(208) 784-1258

Fax (208) 783-0891

Ferguson Contracting
901 N. Division
Pinehurst, ID 83850

Project: BHCTP

Sampled: 02-Feb-17
Received: 03-Feb-17
Reported: 06-Feb-17 13:49

LAB #	X780060-01	X780060-02	X780060-03	X780060-04	-	-
SAMPLE ID	KT-02-02-17	PTM-02-02-17	QC-02-02-17	CTP004-02-02-17	-	-
	02/02/2017 07:30	02/02/2017 08:00	02/02/2017 08:00	02/02/2017 07:50	-	-

Reporting Limit

Metals (Total) (Water)

Cadmium	0.0100 mg/l	0.0716	0.960	0.963	0.0552	-	-
Lead	0.0500 mg/l	0.386	0.0147 [2]	0.0156 [2]	0.301	-	-
Manganese	0.0200 mg/l	70.6	-	-	-	-	-
Zinc	0.0200 mg/l	43.9	8.50	8.55	0.697	-	-

Classical Chemistry Parameters (Water)

pH	pH Units	5.32 [1]	7.49 [1]	7.45 [1]	-	-	-
Total Susp. Solids	mg/l	77.0	0.6 [2]	<0.0 [4]	-	-	-

John Kern
Laboratory Director



One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Ferguson Contracting 901 N. Division Pinehurst, ID 83850	Project: BHCTP	Sampled: 03-Feb-17
		Received: 03-Feb-17
		Reported: 06-Feb-17 13:49

LAB #	X780059-01	-	-	-	-	-
SAMPLE ID	006-03-03-17	-	-	-	-	-
	02/03/2017 06:00	-	-	-	-	-
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.0032 [2]	-	-	-	-
Lead	0.0500 mg/L	<0.0036 [3]	-	-	-	-
Manganese	0.0200 mg/L	13.7 [3]	-	-	-	-
Zinc	0.020 mg/L	0.102	-	-	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	6.82 [1]	-	-	-	-
Total Susp. Solids	5.0 mg/L	1.4 [4]	-	-	-	-

John Kern
Laboratory Director



One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Ferguson Contracting 901 N. Division Pinehurst, ID 83850	Project: BHCTP	Sampled: 06-Feb-17
		Received: 06-Feb-17
		Reported: 07-Feb-17 14:06

LAB #	X780089-01	-	-	-	-	-
SAMPLE ID	006-02-06-17	-	-	-	-	-
	02/06/2017 06:00	-	-	-	-	-
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.0032 [2]	-	-	-	-
Lead	0.0500 mg/L	<0.0036 [4]	-	-	-	-
Manganese	0.0200 mg/L	17.0 [3]	-	-	-	-
Zinc	0.020 mg/L	0.127	-	-	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	6.97 [1]	-	-	-	-
Total Susp. Solids	5.0 mg/L	1.0	-	-	-	-

John Kern
Laboratory Director



One Government Gulch - PO Box 929 Kellogg ID 83837-0929

(208) 784-1258

Fax (208) 783-0891

Ferguson Contracting
901 N. Division
Pinehurst, ID 83850

Project: BHCTP

Sampled: 06-Feb-17
Received: 06-Feb-17
Reported: 08-Feb-17 09:23

LAB #	X780090-01	-	-	-	-	-
SAMPLE ID	KT-02-06-17	-	-	-	-	-
	02/06/2017 07:30	-	-	-	-	-

Metals (Total) (Water)

Cadmium	0.0100 mg/L	0.0649	-	-	-	-
Lead	0.0500 mg/L	0.396	-	-	-	-
Manganese	0.0200 mg/L	68.1 [3]	-	-	-	-
Zinc	0.020 mg/L	52.8 [1] [3]	-	-	-	-

Classical Chemistry Parameters (Water)

pH	pH Units	5.23 [2]	-	-	-	-
Total Susp. Solids	mg/L	75.0	-	-	-	-

John Kern
Laboratory Director



One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Ferguson Contracting 901 N. Division Pinehurst, ID 83850	Project: BHCTP	Sampled: 08-Feb-17
		Received: 08-Feb-17
		Reported: 09-Feb-17 14:49

LAB #	XJ780129-01	-	-	-	-	-
SAMPLE ID	006-CO-08-17	-	-	-	-	-
	02/08/2017 06:00	-	-	-	-	-
Reporting Limit						
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.0034 [2]	-	-	-	-
Lead	0.0500 mg/L	<0.0036 [4]	-	-	-	-
Manganese	0.0200 mg/L	15.7 [3]	-	-	-	-
Zinc	0.020 mg/L	0.128	-	-	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	6.88 [1]	-	-	-	-
Total Susp. Solids	5.0 mg/L	1.2	-	-	-	-

John Kern
Laboratory Director



One Government Gulch - PO Box 929 Kellogg ID 83837-0929

(208) 784-1258 Fax (208) 783-0891

Ferguson Contracting 901 N. Division Pinehurst, ID 83850	Project: BHCTP	Sampled: 09-Feb-17
		Received: 10-Feb-17
		Reported: 13-Feb-17 16:40

LAB #	X780179-01	X780179-02	-	-	-	-
SAMPLE ID	KT-02-09-17	CTPXX-02-09-17	-	-	-	-
	02/09/2017 07:30	02/09/2017 07:50	-	-	-	-

Reporting Limit

Metals (Total) (Water)

Cadmium	0.0100 mg/L	0.0734	0.0566	-	-	-	-
Lead	0.0500 mg/L	0.398	0.303	-	-	-	-
Manganese	0.0200 mg/L	72.6	-	-	-	-	-
Zinc	0.020 mg/L	46.5 [1]	0.715	-	-	-	-

Classical Chemistry Parameters (Water)

pH	pH Units	9.25 [2]	-	-	-	-	-
Total Susp. Solids	mg/L	79.0	-	-	-	-	-

Kirby Gray
Technical Director



One Government Gulch - PO Box 929 Kellogg ID 83837-0929

(208) 784-1258 Fax (208) 783-0891

Ferguson Contracting 901 N. Division Pinehurst, ID 83850	Project: BHCTP	Sampled: 10-Feb-17
		Received: 10-Feb-17
		Reported: 13-Feb-17 15:45

LAB #	X780178-01	X780178-02	-	-	-	-
SAMPLE ID	006-CO-10-17	006-CO-10-17	-	-	-	-
	02/10/2017 06:00	02/10/2017 06:00	-	-	-	-

Reporting Limit

Metals (Total) (Water)

Cadmium	0.0100 mg/L	0.0019 [2]	0.0021 [2]	-	-	-	-
Lead	0.0500 mg/L	<0.0036 [4]	<0.0036 [4]	-	-	-	-
Manganese	0.0200 mg/L	8.79 [3]	8.50	-	-	-	-
Zinc	0.020 mg/L	0.156	0.157	-	-	-	-

Classical Chemistry Parameters (Water)

pH	pH Units	7.04 [1]	7.03 [1]	-	-	-	-
Total Susp. Solids	mg/L	5.0	0.6 [2]	-	-	-	-

Kirby Gray
Technical Director



One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Ferguson Contracting 901 N. Division Pinehurst, ID 83850	Project: BHCTP	Sampled: 13-Feb-17
		Received: 13-Feb-17
		Reported: 14-Feb-17 13:40

LAB #	XJ780220-01	-	-	-	-	-
SAMPLE ID	006-CO-13-17	-	-	-	-	-
	02/13/2017 06:00	-	-	-	-	-
Reporting Limit						
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.0034 [2]	-	-	-	-
Lead	0.0500 mg/L	<0.0036 [3]	-	-	-	-
Manganese	0.0200 mg/L	15.5 [3]	-	-	-	-
Zinc	0.020 mg/L	0.140	-	-	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	6.91 [1] [4]	-	-	-	-
Total Susp. Solids	5.0 mg/L	0.2 [2]	-	-	-	-

Kirby Gray
Technical Director



One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Ferguson Contracting 901 N. Division Pinehurst, ID 83850	Project: BHCTP	Sampled: 13-Feb-17
		Received: 13-Feb-17
		Reported: 14-Feb-17 14:27

LAB #	X780221-01	-	-	-	-	-
SAMPLE ID	KT-02-13-17	-	-	-	-	-
	02/13/2017 07:30	-	-	-	-	-
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.0695	-	-	-	-
Lead	0.0500 mg/L	0.526	-	-	-	-
Manganese	0.0200 mg/L	67.0 [3]	-	-	-	-
Zinc	0.020 mg/L	41.7 [3]	-	-	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	5.28 [1]	-	-	-	-
Total Susp. Solids	mg/L	62.0	-	-	-	-

Kirby Gray
Technical Director



One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Ferguson Contracting 901 N. Division Pinehurst, ID 83850	Project: BHCTP	Sampled: 15-Feb-17
		Received: 15-Feb-17
		Reported: 16-Feb-17 11:44

LAB #	X780261-01	-	-	-	-	-
SAMPLE ID	006-CO-15-17	-	-	-	-	-
	02/15/2017 06:00	-	-	-	-	-
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.0029 [2]	-	-	-	-
Lead	0.0500 mg/L	<0.0036 [3]	-	-	-	-
Manganese	0.0200 mg/L	16.9 [3]	-	-	-	-
Zinc	0.020 mg/L	0.135	-	-	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	6.91 [1] [4]	-	-	-	-
Total Susp. Solids	5.0 mg/L	0.2 [2]	-	-	-	-

John Kern
Laboratory Director



One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Ferguson Contracting 901 N. Division Pinehurst, ID 83850	Project: BHCTP	Sampled: 16-Feb-17
		Received: 17-Feb-17
		Reported: 20-Feb-17 11:22

LAB #	X780333-01	X780333-02	X780333-03	-	-	-
SAMPLE ID	KT-02-16-17	PTM-02-16-17	CTPXX-02-16-17	-	-	-
	02/16/2017 07:30	02/16/2017 08:00	02/16/2017 07:00	-	-	-
Reporting Limit						
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.0774	1.05	0.0562	-	-
Lead	0.0500 mg/L	0.480	0.0297 [2]	0.306	-	-
Manganese	0.0200 mg/L	64.7	-	-	-	-
Zinc	0.0200 mg/L	44.8	10.3	0.715	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	3.26 [1]	7.31 [1]	-	-	-
Total Susp. Solids	5.0 mg/L	73.0	0.6 [2]	-	-	-

John Kern
Laboratory Director



One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Ferguson Contracting 901 N. Division Pinehurst, ID 83850	Project: BHCTP	Sampled: 17-Feb-17
		Received: 17-Feb-17
		Reported: 20-Feb-17 11:21

LAB #	X780332-01	-	-	-	-	-
SAMPLE ID	006-CO-17-17	-	-	-	-	-
	02/17/2017 06:00	-	-	-	-	-
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.0034 [2]	-	-	-	-
Lead	0.0500 mg/L	<0.0036 [3]	-	-	-	-
Manganese	0.0200 mg/L	16.9	-	-	-	-
Zinc	0.020 mg/L	0.138	-	-	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	6.90 [1]	-	-	-	-
Total Susp. Solids	5.0 mg/L	0.8 [2]	-	-	-	-

John Kern
Laboratory Director



One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Ferguson Contracting 901 N. Division Pinehurst, ID 83850	Project: BHCTP	Sampled: 20-Feb-17
		Received: 20-Feb-17
		Reported: 21-Feb-17 15:34

LAB #	X780374-01	-	-	-	-	-
SAMPLE ID	006-CO-20-17	-	-	-	-	-
	02/20/2017 06:00	-	-	-	-	-
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.0074 [2]	-	-	-	-
Lead	0.0500 mg/L	<0.0036 [3]	-	-	-	-
Manganese	0.0200 mg/L	6.78	-	-	-	-
Zinc	0.020 mg/L	0.349	-	-	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	7.22 [1]	-	-	-	-
Total Susp. Solids	5.0 mg/L	0.6 [2]	-	-	-	-

John Kern
Laboratory Director



One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Ferguson Contracting 901 N. Division Pinehurst, ID 83850	Project: BHCTP	Sampled: 20-Feb-17
		Received: 20-Feb-17
		Reported: 21-Feb-17 15:34

LAB #	X780375-01	-	-	-	-	-
SAMPLE ID	KT-02-20-17	-	-	-	-	-
	02/20/2017 07:30	-	-	-	-	-
Reporting Limit						
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.0059	-	-	-	-
Lead	0.0500 mg/L	0.628	-	-	-	-
Manganese	0.0200 mg/L	60.0 [4]	-	-	-	-
Zinc	0.0200 mg/L	50.1 [1] [4]	-	-	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	9.11 [2]	-	-	-	-
Total Susp. Solids	mg/L	74.0	-	-	-	-

John Kern
Laboratory Director



One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Ferguson Contracting 901 N. Division Pinehurst, ID 83850	Project: BHCTP	Sampled: 23-Feb-17
		Received: 24-Feb-17
		Reported: 27-Feb-17 11:36

LAB #	X780475-01	X780475-02	X780475-03	X780475-04	X780475-05	-
SAMPLE ID	KT-02-23-17	QC-02-23-17	RB-02-23-17	TB-02-23-17	CTPXX-02-23-17	-
Reporting Limit	02/13/2017 07:30	02/13/2017 07:30	02/13/2017 06:00	02/13/2017 06:00	02/13/2017 07:00	-

Metals (Total) (Water)

Cadmium	0.0100 mg/L	0.0959	0.0985	<0.0009 [4]	<0.0009 [4]	0.0564	-
Lead	0.0500 mg/L	0.605	0.624	<0.0036 [4]	0.0039 [3]	0.310	-
Manganese	0.0200 mg/L	62.3	63.7	-	-	-	-
Zinc	0.0200 mg/L	55.2 [1]	56.7 [1]	0.039	<0.003 [4]	0.725	-

Classical Chemistry Parameters (Water)

pH	pH Units	5.13 [2]	5.13 [2]	-	-	-	-
Total Susp. Solids	mg/L	75.0	74.0	-	-	-	-

John Kern
Laboratory Director



One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Ferguson Contracting 901 N. Division Pinehurst, ID 83850	Project: BHCTP	Sampled: 24-Feb-17
		Received: 24-Feb-17
		Reported: 27-Feb-17 11:34

LAB #	X780474-01	-	-	-	-	-
SAMPLE ID	006-CO-24-17	-	-	-	-	-
	02/24/2017 06:00	-	-	-	-	-
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.0064 [2]	-	-	-	-
Lead	0.0500 mg/L	<0.0036 [4]	-	-	-	-
Manganese	0.0200 mg/L	23.2 [3]	-	-	-	-
Zinc	0.020 mg/L	0.360	-	-	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	6.92 [1]	-	-	-	-
Total Susp. Solids	5.0 mg/L	0.4 [2]	-	-	-	-

John Kern
Laboratory Director



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

Fax (208) 783-0891

Ferguson Contracting 901 N. Division Pinehurst, ID 83850	Project: BHCTP	Sampled: 27-Feb-17
		Received: 27-Feb-17
		Reported: 28-Feb-17 11:20

LAB #	X780505-01	X780505-02	-	-	-	-
SAMPLE ID	KT-02-27-17	006-02-27-17	-	-	-	-
Reporting Limit	02/27/2017 07:30	02/27/2017 06:00	-	-	-	-

Metals [Total] (Water)

Cadmium	0.0100 mg/L	0.114	0.0056 [3]	-	-	-	-
Lead	0.0500 mg/L	0.550	<0.0086 [5]	-	-	-	-
Manganese	0.0200 mg/L	67.2	25.2 [4]	-	-	-	-
Zinc	0.020 mg/L	65.5 [1]	0.357	-	-	-	-

Classical Chemistry Parameters (Water)

pH	pH Units	3.04 [2]	6.86 [2]	-	-	-	-
Total Susp. Solids	mg/L	5.0	89.0	0.4 [3]	-	-	-

John Kern
Laboratory Director